

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: **TAUBER et. al**

Parent Application Serial No.: **09/845,108**

5 Parent Application Filed: **April 26, 2001**

Attorney Docket No.: **CECOM 5522**

For: **RARE EARTH METAL COMPOUNDS FOR USE IN HIGH CRITICAL  
TEMPERATURE THIN FILM SUPER-CONDUCTING ANTENNAS**

10 Sir:

In accordance with Revised Amendment Format, these Remarks are submitted to support amending the above-identified application.

**REMARKS**

15 Claims 1-79 are now in the case. Claims 1-47 and 49-79 are drawn to non-elected claims and have been withdrawn. Claim 48, as amended, is directed to an antenna composed of a single layer of a copper oxide superconductor deposited onto a single crystal substrate having the formula  $\text{Sr}_2\text{LuSbO}_6$ . New claim 80 has been added.

20 This is a divisional application of U.S. Patent Office Application Serial No. 09/845,108, entitled, "Rare Earth Metal Compounds For Use In High Critical Temperature Thin Film Super-Conductors, Ferroelectrics, Pyroelectrics, Piezoelectrics and Hybrids," which was designated as CECOM Docket No. 5469 and filed on April 26, 2001, hereinafter the "parent case." In the parent case (09/845,108), the Examiner issued a restriction requirement and following Applicants' election of claims to Invention Group I and several amendments, the Examiner  
25 issued a Notice of Allowance. The parent case (09/845,108) is currently pending before the U.S. Patent Office, and this co-pending divisional application is prosecuting a previously non-elected claim from the parent case.

30 The parent case (09/845,108) was a continuation in part of U.S. Patent Office Application Serial No. 09/337,724, with the same title, filed on June 21, 1999, and designated as CECOM Docket No. 5433, which was a continuation in part of U.S. Patent Office Application Serial No. 08/717,822 with the same title, filed on September 24, 1996 and designated as CECOM Docket

No. 5304. That application (Serial No. 08/717,822) was a continuation in part of U.S. Patent and Trademark Office Application Number 08/333,669 entitled, "Rare Earth Metal Containing Compounds and High Critical Temperature Thin Film Superconductors, Ferroelectrics, Pyroelectrics, Piezoelectrics, And Hybrids Including the Rare Earth Metal Containing Compounds," filed on November 3, 1994 and designated as CECOM Docket No. 5097, the "first application." It is respectfully submitted that the parent case (09/845,108) filed on April 26, 2001 by the inventors herein, is currently pending before the U.S. Patent Office and is therefore "an application similarly entitled to the benefit of the filing date of the first application," as mandated by 35 USC § 120 and 35 USC § 121, which is November 3, 1994. This divisional application's specification, as amended, claims priority from the November 3, 1994 effective filing date of the first application (08/333,669).

As required by the Revised Amendment Format, separate Amendments To The Claims, Amendments To The Specification and these Remarks are enclosed with this Amendment.

The Examiner from the parent case (09/845,108) required a restriction to one of five groups of inventions under 35 USC § 121. In response to that restriction requirement, Applicants elected Invention Group I, which were drawn to a rare earth compound. In the parent case (09/845,108), the Examiner issued a Notice of Allowance allowing amended claims 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40 and 43. In this Preliminary Amendment to the within divisional application, Applicants seek to prosecute claim 48 from Invention Group No IV, which is drawn to an antenna, classified by the United States Patent & Trademark Office in Class 343, subclass 772, comprising a single layer of a copper oxide superconductor deposited onto a single crystal substrate having the formula  $\text{Sr}_2\text{LuSbO}_6$ . This Preliminary Amendment revises previously non-elected claim 48 in a manner consistent with the parent case's allowed claims, includes a new claim 80 drawn to a copper oxide superconductor layer deposited onto a substrate having a  $\text{Sr}_2\text{LuSbO}_6$  buffered layer and otherwise puts this divisional application in a condition for allowance.

In the parent case (09/845,108), the Examiner rejected the claims for obviousness under 35 USC § 103 as being obvious over an article by Fesenko entitled "Synthesis and Study of  $\text{A}_2\text{Sb}_5\text{O}_6$  and  $\text{A}_3\text{Sb}_{25}\text{B}'\text{O}_9$ -type Ternary Oxides with Perovskite Structure," an article by

Wittmann et al. entitled "On The Ordering Of B<sup>III</sup> and M<sup>V</sup> In Perovskites of the Type A<sub>2</sub>B<sup>III</sup>M<sup>V</sup>O<sub>6</sub>" and an article by Blasse entitled "New Compounds With Perovskite-Like Structures." After filing a Request For Continued Examination, claims 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40 and 43 were amended from objectionable dependent claims depending upon rejected base claims to independent claims for dielectric substrates. For example, claim 7 from the parent case (09/845,108) recited a dielectric substrate of the general formula Sr<sub>2</sub>RESbO<sub>6</sub>, further comprising the compound Sr<sub>2</sub>YbSbO<sub>6</sub>, where the general formula included an Sb<sup>5+</sup> constituent atom with a polarizability of about 1.2 Å<sup>3</sup>, the dielectric substrate being heated for at least 20 hours at between 1400° C and 1600 ° C and being constructed in a bulk form, having a specific low dielectric constant and low dielectric loss and the dielectric substrate having an ordered perovskite pseudo-cubic tetragonal crystalline structure. It is respectfully submitted that reciting the crystalline structure of the parent case's dielectric substrates was a significant difference between them and cited prior art references supporting the allowability of those claims.

It is respectfully submitted that claim 48, as amended, now includes an ordered perovskite pseudo-cubic tetragonal crystalline structure similar to the parent case's allowed claims 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40 and 43. Claim 48, as amended, now recites an antenna, comprising a single layer of a copper oxide superconductor deposited onto a single crystal substrate of the formula Sr<sub>2</sub>LuSbO<sub>6</sub>, the single crystal substrate being heated for at least 20 hours at between 1400° C and 1600 ° C and being constructed in a bulk form, the single crystal substrate having a low dielectric constant of 15.1 and a low dielectric loss of less than 1 x 10<sup>-3</sup> without a phase transition, the formula including an Sb<sup>5+</sup> constituent atom with a polarizability of about 1.2 Å<sup>3</sup>, the single layer of a copper oxide superconductor being patterned to complete the device and single crystal substrate having an ordered perovskite cubic crystalline structure. New claim 80 recites a copper oxide superconductor layer deposited onto a substrate having a buffered layer with the formula Sr<sub>2</sub>LuSbO<sub>6</sub> and an ordered perovskite cubic crystalline structure. It is respectfully submitted that the ordered perovskite cubic crystalline structure feature is adequately supported by several specification passages. For example, specification page 3, lines 13-15, states:

Indexed powder diffractometer data taken using CuKα radiation, reveals these



HTSC is then patterned to complete the device. (Emphasis Supplied)

The Amendments To The Specification relate to formal matters such as revising the title, adding a statement claiming priority from the November 3, 1994 effective filing date of the first application, substituting the term "antenna" for "dielectric substrate" on specification page 2, lines 12-14 and correcting a few informalities, without adding any prohibited new matter.

For these reasons, it is respectfully submitted that claim 48, as amended, has been revised in a manner similar to allowed claims 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40 and 43 of the parent case (09/845,108). Therefore, it is respectfully requested that claim 48, as amended, and new claim 80 be allowed and pass to issue.

Should the Examiner require further information, the Examiner is invited to telephone the applicants' attorney at the telephone number listed below.

Respectfully Submitted,

17 February 2004

DATE



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